Non-CO_2 Greenhouse Gases: Methane

Source/Sectors: Natural Gas Systems (Processing; Transmission)

Technology: Automate systems operation to reduce venting (A.1.2.3.20)

Description of the Technology:
Natural gas produced from gas fields needs to be transported to distribution systems, power plants, or chemical plants through high-pressure pipelines. Compressor stations, which contain large reciprocating engines and turbine compressors, are used to move the gas throughout the United States. Natural gas is also injected and stored in subsurface formations, or liquefied and stored in aboveground tanks to meet the fluctuations in gas demand. Sources of methane emissions include emissions from compressors, metering, and regulating stations, dehydrators, and pneumatic devices (USEPA, 2006a).

Transmission pipelines often have multiple compressor stations with five to ten compressors at each station. Where these compressors have older ignition systems, shutdowns and restarts result in blowdown and gas pneumatic starter emissions that release excessive amounts of methane to the atmosphere. Employing automatic control systems on compressor ignition systems can increase the operational efficiency and reliability of the compressor and also reduce methane emissions (USEPA, 2004).

Effectiveness: One partner of the Natural Gas STAR program reported methane savings of 11,092 Mcf per year over 3 years for multiple applications (USEPA, 2008).

Implementability: This option is applicable to all electrified transmission stations.

Reliability: Methane emissions savings of 20 Mcf per year are estimated for a 3,000 HP reciprocating compressor that requires three attempts to start up and one avoidable blowdown per year (USEPA, 2008).

Maturity: Good

Environmental Benefits: Methane emission reduction

Cost Effectiveness: This technology typically has a quick payback. The one-time capital cost for installing a PLC on a reciprocating compressor is justified by the lower operation and maintenance costs rather than gas savings. PLCs reduce methane emissions by providing a better service factor and fewer compressor surges, reducing the amount of methane that is vented to the atmosphere (USEPA, 2008).

- Capital Costs (including installation): $1,000-$10,000
- Operating and Maintenance Costs (annual): $100-$1,000
- Payback (Years): 0-1

Industry Acceptance Level: Louisville Gas and Electric Company; Natural Gas Pipeline Company (now Kinder Morgan, Inc.)

Limitations: An electrical power supply is required to operate the automatic systems.

Sources of Information:

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